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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,810	06/07/2001	Jonathan J. Barrow	EMC-01-087	1207
7590	05/19/2005		EXAMINER	
DAVID E. HUANG, ESQ. CHAPIN & HUANG, LLC WESTBOROUGH OFFICE PARK 1700 WEST PARK DRIVE WESTBOROUGH, MA 01581			TAYLOR, NICHOLAS R	
		ART UNIT	PAPER NUMBER	
		2141		
DATE MAILED: 05/19/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/877,810	BARROW ET AL.
Examiner	Art Unit	
Nicholas R. Taylor	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 4/8/2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14, 18-31 and 35-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14, 18-31 and 35-41 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 06/07/2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

1. Claims 1-14, 18-31, and 35-41 have been presented for examination and are rejected.

Response to Arguments

2. Applicant's arguments filed 4/8/2005 have been fully considered but they are deemed not persuasive.
3. Applicant's arguments with respect to claims 35-41 have been considered but are moot in view of the new ground(s) of rejection.
4. In the remarks, applicant argued in substance that:
 - (A) The combination of the prior art of Papa and Hoesel was improper due to unobviousness. Specifically, nothing in the art would enable a functional combination of Papa and Hoesel. Furthermore, the prior art does not teach a test loop with verification of the I/O controller.
 - As to point (A), in response to applicant's argument that the combination of Papa and Hoesel would not produce a properly functioning system, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly

suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a test loop with verification of the I/O controller, as outlined in the specification) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(B) Applicant argues the merits of point (A) above, with respect to claims 18-31.

As to point (B), see response to point (A) above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 5-8, 10, 11, 14, 18-20, 22-25, 27, 28, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papa et al. (US Patent 6,342,608) and Hoese et al. (US Patent 6,421,753.)

7. As per claims 1 and 18, Papa teaches a network adapter that may be used in a network data storage system (Papa, column 3, line 65 to column 4, line 6) to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller, the controller residing in the data storage system, the data exchanging devices being external to the adapter, the adapter comprising (Papa, column 7, lines 26-33):

one or more interfaces that may be coupled to an electrical backplane of the system, the backplane being coupled to the controller and being configured to permit communication between the controller and the adapter when the one or more interfaces are coupled to the backplane (Papa, column 7, lines 7-15, and figure 3c);

and a system integrated into the adapter, the system having a first set of ports that may be coupled to the data exchanging devices (Papa, column 8, lines 33-38) and a second set of ports that may couple the system to the controller when the one or more interfaces are coupled to the backplane (Papa, column 7, lines 7-15, and figure 3c.)

However, although Papa teaches the use of any compatible controller card (Papa, column 8, lines 45-48), Papa fails to teach the specific use of a switch system. Hoese teaches the use of a switch system that controls data flow in a storage network (Hoese, column 3, lines 38-44.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa and Hoese to provide the switching system of Hoese in the system of Papa, because doing so would allow the ability to centralize local storage for networked workstations and allow

accessing the virtual storage as if it were local. This is stated as referenced in the art (Hoeze, column 2, lines 26-29.)

8. As per claims 2 and 19, Papa-Hoeze teaches the system further wherein the one or more interfaces comprise at least one interface through which a command may be issued to the adapter to cause the adapter to change from an operational mode to a diagnostic mode (Hoeze, column 7, lines 24-28.)

9. As per claims 3 and 20, Papa-Hoeze teaches the system further wherein the data storage system comprises a set of mass storage devices that may exchange data with the data exchanging devices via the adapter (Papa, column 3 line 65 to column 4, line 6.)

10. As per claims 5 and 22, Papa-Hoeze teaches the system further wherein the switching system comprises a fibre channel switching fabric (Hoeze, column 3, lines 33-36.)

11. As per claims 6 and 23, Papa-Hoeze teaches the system further wherein the one or more interfaces comprise a management interface through which the controller may issue (Hoeze, column 7, lines 24-28) via the backplane a command to the adapter (Papa, column 7, lines 26-33.)

12. As per claims 7 and 24, Papa-Hoese teaches the system further wherein the one or more interfaces permit a processor to issue a command to the adapter via the backplane, the processor being external to the data exchanging devices, the adapter, and the controller (Papa, column 4, lines 11-16, wherein the processor is a separate module external to the others, see also figures 1 and 2.)

13. As per claims 8 and 25, Papa-Hoese teaches the system further wherein the processor is external to the data storage system (Papa, column 4, lines 11-16, wherein the processor is a separate module external to the data storage devices, such as those shown 172 of figure 1.)

14. As per claims 10 and 27, Papa-Hoese teaches the system further wherein the one or more interfaces include a first interface and a second interface, the first interface permitting the controller to issue a first command to the adapter for causing the adapter to change from a first mode of operation to a second mode of operation (Hoese, column 7, lines 25-30), the second interface permitting configuration-related information to be retrieved from a non-volatile memory comprised in the adapter (Hoese, column 6, line 61 to column 7, line 3.)

15. As per claims 11 and 28, Papa-Hoese teaches the system further wherein in the second mode of operation, a diagnostic test of the adapter is performed (Hoese, column 7, lines 25-30.)

16. As per claims 14 and 31, Papa-Hoese teaches the system further wherein the adapter is an electrical circuit card that is configured to be electrically and mechanically coupled to the backplane (Papa, column 7, lines 7-15.)

17. Claims 4, 9, 21, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papa et al. (US Patent 6,342,608) and Hoese et al. (US Patent 6,421,753) and Droms ("Dynamic Host Configuration Protocol.")

18. As per claims 4 and 21, Papa-Hoese teaches the system above wherein the adapter has a slot identification number that identifies a location in the data storage system (Papa, figure 2, by canister/slot number.) However, Papa-Hoese fails to teach assigning a network layer address based upon location.

Droms teaches assigning a network address based on an identifier location (Droms, sections 2.1-2.2.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Droms to provide the IP assignment of Droms in the system of Papa-Hoese, because doing so would allow allocating network addresses enabling use of TCP/IP communication (Droms, abstract.)

19. As per claims 9 and 26, Papa-Hoese teaches the system above wherein an adapter may be changed during a configuration of the data storage system, the

processor being coupled to the adapter via a network, the adapter being accessible via the network (Hoese, column 6, line 61 to column 7, line 3.) However, Papa-Hoese fails to teach the changing to a second network address which is accessible via the network.

Drums teaches changing a network address which is then usable by a network (Drums, section 3.2.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Drums to provide the IP assignment of Drums in the system of Papa-Hoese, because doing so would allow allocating network addresses enabling use of TCP/IP communication. This is stated as referenced in the art (Drums, abstract.)

20. Claims 12, 13, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papa et al. (US Patent 6,342,608) and Hoese et al. (US Patent 6,421,753) and "Ping Manual Page" ("Ping" hereafter.)

21. As per claims 12 and 29, Papa-Hoese teaches the system above wherein the diagnostic test comprises one of a built-in self-test (BIST) of the adapter (Hoese, column 7, lines 19-24.) However, Papa-Hoese fails to teach a different test of the adapter, the different test including transmission of a test vector along a first test path in the adapter, the test path beginning and ending at a first I/O port that couples the adapter to the controller when the one or more interfaces are coupled to the backplane, the test path including a subset of the first set of ports of the switching system.

Ping teaches a test including a test vector that goes along a path that begins and ends at a first I/O port, whose path includes a subset of the first set of ports of the system (Ping, description.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Ping to provide the testing of Ping in the system of Papa-Hoese, because doing so would allow diagnostic testing of the network.

22. As per claims 13 and 30, Papa-Hoese-Ping teaches the system further wherein the different test also includes the transmission of a test vector along a second test path in the adapter, the second test path beginning and ending at a different I/O port that couples the adapter to the controller when the one or more interfaces are coupled to the backplane, the second test path including a different subset of the first set of ports of the switching system (Ping, description.)

23. Claims 35-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papa et al. (US Patent 6,342,608) and Hoese et al. (US Patent 6,421,753) and Story (US Patent 6,260,092.)

24. As per claims 35 and 38, Papa-Hoese teaches the system further wherein the switching system is configured to selectively provide one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports (Papa, column 7, lines 26-33.)

However, Papa fails to teach (ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports.

Story teaches managing fibre channel serial connections (Story, Summary section) wherein a test vector is looped back through a fibre system for diagnostic testing (Story, column 3, lines 28-39.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Story to provide the fibre channel system improvements of Story in the system of Papa-Hoese, because doing so would improve the bandwidth and provide connectivity to buses while maintaining compatibility with present controllers and peripherals.

25. As per claims 36 and 39, Papa-Hoese-Story teaches the system further wherein the switching system is further configured to isolate the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices when the switching system selectively provides the test loop (Story, column 3, lines 28-39, specifically wherein the loop testing is performed without producing output.)

26. As per claims 37 and 40, Papa-Hoese-Story teaches the system further wherein the controller is a single circuit board having multiple Fibre Channel interfaces (Hoese, column 3, lines 33-36) and wherein the switching system is configured to daisy chain

the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices when the switching system selectively provides the test loop (Story, column 7, lines 45-55.)

27. As per claim 41, Papa teaches a network adapter configured to permit data communication among data exchanging devices and a data storage system input/output (I/O) controller of a network data storage system (Papa, column 3, line 65 to column 4, line 6), the controller residing in the data storage system, the data exchanging devices being external to the data storage system, the network adapter comprising (Papa, column 7, lines 26-33):

adapter interfaces configured to couple to an electrical backplane of the network data storage system, the electrical backplane being coupled to the controller and being configured to permit communication between the controller and the adapter when the adapter interfaces couple to the electrical backplane; (Papa, column 7, lines 7-15, and figure 3c) and

a subsystem coupled to the adapter interfaces, the subsystem having a first set of ports configured to couple to the data exchanging devices (Papa, column 8, lines 33-38) and a second set of ports configured to couple to the controller when the adapter interfaces couple to the electrical backplane (Papa, column 7, lines 7-15, and figure 3c.)

However, although Papa teaches the use of any compatible controller card (Papa, column 8, lines 45-48), Papa fails to teach the specific use of a switch system. Hoese teaches the use of a switch system that controls data flow in a storage network

(Hoese, column 3, lines 38-44.) It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa and Hoese to provide the switching system of Hoese in the system of Papa, because doing so would allow the ability to centralize local storage for networked workstations and allow accessing the virtual storage as if it were local (Hoese, column 2, lines 26-29.)

Furthermore, Papa-Hoese teaches

the switching subsystem being configured to selectively provide one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports; (Papa, column 7, lines 26-33) and

the controller being a single circuit board having multiple Fibre Channel interfaces (Hoese, column 3, lines 33-36).

However, Papa-Hoese fails to teach

(ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports;

the switching subsystem being further configured to isolate the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices when the switching subsystem selectively provides the test loop; and

the switching subsystem being further configured to daisy chain the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices when the switching subsystem selectively provides the test loop.

Story teaches managing fibre channel serial connections (Story, Summary section) wherein a test vector is looped back through a fibre system for diagnostic testing (Story, column 3, lines 28-39.) Story also teaches the controller isolated from the data exchanging devices to avoid escape of signals when providing the test loop (Story, column 3, lines 28-39, specifically wherein the loop testing is performed without producing output) and Story teaches daisy chained multiple fibre interfaces exclusive of data exchanging devices when providing a test loop (Story, column 7, lines 45-55.)

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Story to provide the fibre channel system improvements of Story in the system of Papa-Hoese, because doing so would improve the bandwidth and provide connectivity to buses while maintaining compatibility with present controllers and peripherals.

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Taylor whose telephone number is (571) 272-3889. The examiner can normally be reached on Monday-Friday, 8:00am to 5:30pm, with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571) 272-3880. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicholas Taylor
Examiner
Art Unit 2141



RUPAL DHARIA
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